



## Natural Heritage & Endangered Species Program

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### Natural Community Fact Sheet HICKORY-HOP HORNBEAM FOREST / WOODLAND

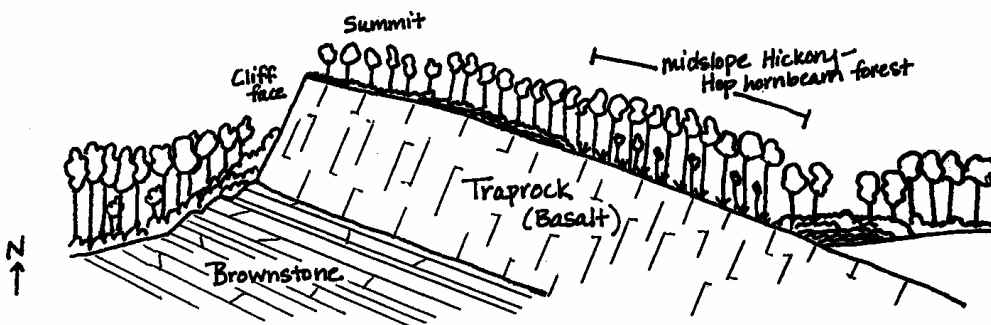
#### Community description

Hickory-Hop Hornbeam forest communities are mixed hardwood forests with a sparse shrub layer and relatively species-rich herbaceous flora. They have a characteristic park-like appearance due to the absence of shrubs and a nearly continuous graminoid cover. They are called forest / woodlands because the trees are often short and the canopy cover, although variable, is often around 60%. Hickory-Hop Hornbeam associations are variants of central hardwood oak-hickory forests where hickories and few oaks occur. Although hickories are a defining feature of the community, the composition of the tree layer is variable, and it is often easier to recognize the community by the absence rather than the presence of certain species. The tree species that are typically absent from Hickory-Hop Hornbeam forests include Hemlock (*Tsuga canadensis*), Beech (*Fagus grandifolia*), Basswood (*Tilia americana*), White Pine (*Pinus strobus*) and the birches (*Betula* spp.).

The factors controlling the establishment and persistence of Hickory - Hop Hornbeam communities are uncertain. At some sites, there is abundant regeneration of hickories and oaks suggesting that the forests are self-maintaining. At other sites, northern hardwood seedlings occur in the understory suggesting that the association is a successional stage that might eventually be replaced in the absence of disturbance. Hickory-Hop Hornbeam forest associations are designated as a Priority Natural Community for protection within the Commonwealth due to their limited distribution. The Massachusetts Natural Heritage & Endangered Species Program tracks high quality examples of this community.



Hickory - Hop Hornbeam Forest/  
Woodland showing sedge and grass  
dominated understory. Photo: T.  
Huguenin, NHESP.



Traprock Ridge illustrating typical location of Hickory-Hop Hornbeam Forests  
Drawing adapted from a 1986 drawing by the Connecticut Natural Heritage Program.

#### Environment

In Massachusetts, many Hickory-Hop Hornbeam forests are associated with traprock (basaltic) ridges of the Connecticut River Valley Highlands where they are found on mid-slopes (15-20 degrees) with southern or eastern exposures. Occurrences of the community tend to be very small (less than 10

acres, with some notable exceptions), often below balds and rock outcrops. Soils are dry, well-drained silt-loams with a variable amount of rockiness. It is uncertain what conditions control the distribution of Hickory-Hop Hornbeam forests, because there is great variation in environmental parameters among sites. Some authors have suggested that Hickory-Hop Hornbeam forests are limited to southern exposures or upper-slopes with good cold-air drainage and extended frost free periods. Historic land-use may also play an important role in their distribution. The presence of Hop Hornbeam and Pennsylvania Sedge (*Carex pensylvanica*) suggest that pasturing may be a controlling factor in their current distribution.

### Characteristic plant species in Massachusetts

Hickory-Hop Hornbeam forests typically have hickories (*Carya ovalis/glabra*) as the dominant overstory tree species mixed with varying amounts of Red Oak (*Quercus rubra*) and White Ash (*Fraxinus americana*). Red and Sugar Maple (*Acer rubrum* and *A. saccharum*) can also be present in lower numbers. Hop hornbeam (*Ostrya virginiana*) is abundant in the subcanopy and shrubs are usually lacking. The herbaceous layer is characterized by a nearly continuous graminoid cover including Bottlebrush Grass (*Hystrix patula*), Canada Bluegrass (*Poa compressa*), Poverty Grass (*Danthonia spicata*), and Long-stalked Sedge (*Carex pedunculata*). Characteristic species include Pennsylvania sedge (*C. pennsylvanica*), Three-lobed Violet (*Viola palmata* var. *triloba*), and Blunt-lobed Hepatica (*Hepatica nobilis* var. *americana*).

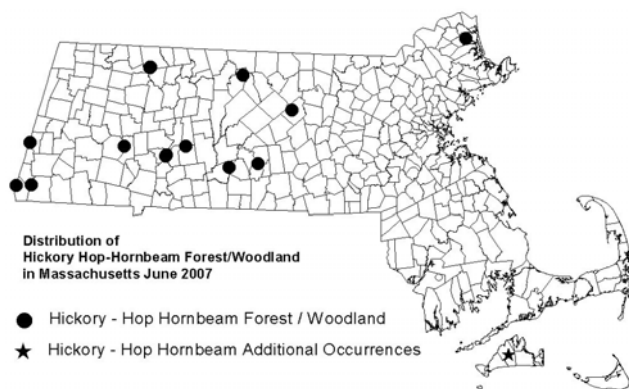
### Characteristic animal species in Massachusetts

Many animals can be found within Hickory-Hop Hornbeam forests because the traprock ridges on which they occur are relatively undeveloped. Deer, raccoons and shrews occupy the forested slopes. Grassy openings and rock ledges with sunny southern and southwestern exposures and associated talus slopes provide suitable habitat for many types of snakes, including copperheads, garter snakes and black rat snakes. Spring Salamanders (*Gyrinophilus porphyriticus*) (delisted in 2006) have been found in mountain streams running through Hickory – Hop Hornbeam forests. Vernal pools occurring in shallow depressions within the forest community provide salamander, frog and turtle habitat.

### Rare species In Hickory-Hop Hornbeam Forest/Woodlands

Violet Sorrel (*Oxalis violacea*)(E), Drooping Speargrass (*Poa saltuensis* spp. *languida*)(E), Shining Wedgegrass (*Sphenopholis nitida*)(T), and Lily-leaved Twayblade (*Liparis lilifolia*)(T) are rare plants of the community. Timber Rattlesnakes (*Crotalus horridus*)(E) have been observed basking on rocks in sunny openings within Hickory-Hop Hornbeam forests. Copperheads (*Agkistrodon contortrix*)(E) and Eastern Rat Snakes (*Elaphe obsoleta*)(E) occupy associated basalt ledges and rock slides. Eastern Box Turtles (*Terrapene carolina*)(SC) have also been observed in these open deciduous forests. Marbled salamanders (*Ambystoma opacum*)(T), four-toed salamanders (*Hemidactylium scutatum*)(SC) and Jefferson's salamander (*Ambystoma jeffersonianum*)(SC) occur in associated vernal wetlands.

SC=State Special Concern, T=State Threatened, E=State Endangered



### Range

Hickory-Hop Hornbeam forest associations occur on middle slopes of traprock (basaltic) ridges in the Highlands of the Connecticut River valley. Excellent examples can be found on the south slopes of Mt. Tom in Holyoke and Mt. Norwottuck in Granby. Variants of the community that are structurally and floristically similar occur statewide: near Mt. Wachusett, on slopes above the Deerfield River, on the Berkshire Plateau, on limestone in southern Berkshire Co., along the Quinebaug River in Southbridge, and on Martha's Vineyard. This community type is also found in Connecticut, New Hampshire, Vermont, and New York.

### Threats and Management Recommendations

All known examples of the community type in Massachusetts have been impacted by cutting and grazing. It is uncertain if those disturbances are necessary to perpetuate the community or if they threaten it. Investigation of the distribution, composition, soils and land-use history of Hickory-Hop Hornbeam communities is needed to determine the factors that influence the occurrence and composition of these forests.

Although some disturbance may be necessary for the community to persist, over-cutting and over-grazing can negatively impact the community by altering community structure, disturbing the thin soil and creating gaps for non-native plant species such as Japanese barberry (*Berberis thunbergii*) to invade. Until more is known about the factors influencing Hickory-Hop Hornbeam forests, intensive cutting and/or grazing should be avoided in this unusual forest type.

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